

# The Mind-Body Problem and Substance Dualism

ONE'S LIFE, from beginning to end, is a sequence of subjective experiences. Because we are so utterly accustomed to being selves, unified centers of subjectivity, we seldom pause to reflect on how mysterious and intriguing is this phenomenon of subjective consciousness. Sometimes, however, perhaps in a moment of extraordinarily intense subjective experience, the wonder of being a conscious self can strike a human being with compelling force.

I recently had such an experience. I was in the middle of a long car trip from northern California to southern Arizona. On the road between Barstow and Needles, the desert and the mountains began to look peculiarly beautiful to me. I was playing some quiet, atmospheric music on the cassette player and reflecting on some recent good fortune. The scenery, the music, and my generally pleased state of mind combined to produce a temporary euphoria. A feeling of great happiness washed over me like a wave. At the very moment of experiencing this wave of joy, it occurred to me: How strange it is that there is an *I* who experiences this. Here is this organism, responding to various sensory stimulations and neural memory traces. Somehow, this organism experiences itself as a unified subject. There is a *person*, a *self*, to whom a wave of joy happens here, and not just a collection of neurons and muscles and electrochemical impulses. Why should this be so? What makes it so?

This is, in its most naked form, the mind-body problem. We know that we have minds; we have mental lives consisting of feelings, thoughts, memories, urges, obsessions, qualms, and so on. We also know that we have brains, nervous systems, and physical bodies. What, precisely, is the relationship between the mental being and the physical being?

What happens when we think or feel? Something goes on in the brain, surely. But does something go on as well in another place, the mind? When we look at brains we see masses of neural tissue. When we look through a microscope we see the tiny, cellular components of this tissue. We never catch a glimpse of a feeling, or a thought, or an urge, however. Yet such

things make up the fabric of our subjective lives. Where are these mental things? Does it even make sense to ask?

Reflective individuals have been trying to say something illuminating about the mind-body problem for thousands of years. Until roughly the 1700s, there were no clear dividing lines among the disciplines we now call empirical science, psychology, and philosophy. Thinkers who called themselves ‘philosophers’ freely speculated on the possible relationships between mind and body and suggested principles to systematize and explain what goes on within consciousness. Nowadays, the philosophy of mind has become distinct from biological science and from psychology.

Neurobiologists, acting on the (well-justified) hypothesis that the activity of the brain gives rise to the phenomena we call ‘mental’, investigate how the brain and nervous system work, seeking some clue as to how this horrendously complicated mass of ‘wetware’ produces consciousness. Psychologists, also proceeding from the modern assumption that the relationship between mind and brain is a very intimate one, concentrate upon finding the principles and mechanisms governing the inner, subjective lives of persons. Philosophers tend to concentrate their attention on conceptual difficulties that arise from the fact that our ways of thinking and talking about persons are inherently dualistic, despite the mind-brain unity that has become scientific orthodoxy.

This is the fact upon which philosophers concentrate: We describe persons and explain their behavior in two ways. On the one hand, a person is taken to be a biological organism, the behavior of which is explainable in terms of events in its environment and in terms of physical goings-on in the brain and nervous system. On the other hand, a person is taken to be a subjective self, a rational agent with a point of view and purposes who performs actions for reasons and is responsible for his or her behavior. Just how these two conceptual schemes or descriptive/explanatory vocabularies mesh is less than clear. It is this latter, peculiarly philosophical, mind-body problem that is treated in this book.

Before the philosophical mind-body problem can be discussed in any detail, it is necessary to set aside a certain widespread and almost certainly mistaken view of the nature of the mind: substance dualism. Substance dualism is the idea that every person is composed of two distinct substances—a physical substance (the body) and a mental substance (the mind or soul).

We live in a time when two views of the nature of persons, fundamentally incompatible with each other, are both widely accepted (often by the same individuals, who somehow remain blissfully unaware of the inconsistencies within their own thoughts). I mean the view of the nature of persons taken by physical science and a more ancient view of the nature of persons associated with many traditional religions.

Children in contemporary America, for example, grow up being taught in school that human beings, like other animals, are complex physical organisms, their nature and behavior based in biological, chemical, and physical processes. (Call this the scientific view.) But the same children are taught in church, and by various sources in the popular culture, that human beings are fundamentally non-physical souls or spirits; these spirits inhabit the physical body and are released from it upon death. (Call this the substance dualist view. Notice, the substance dualist view is not *necessarily* associated with religion.) The irreconcilable conflict between these two views is obvious if one devotes barely more than passing thought to the matter.

The scientific view is that life, consciousness, and rational thought are phenomena that have evolved in certain complex physical systems; these phenomena arise from the functioning of those physical systems. Scientists operate on the faith that, in time, we will fully understand the nature of these phenomena. When the physical system deteriorates or is damaged and ceases to function, life and mental phenomena cease; the individual consciousness that once characterized that organism is no more. The self or individual consciousness of an organism can no more continue to exist after the organism dies than the running of an automobile can continue to exist after the engine is switched off or melted down. The substance dualist view suggests that human life, consciousness, and rational thought are properties of a substance or entity separable from the physical organism. When the human body deteriorates or is damaged and ceases to function, the person's life, consciousness, and rational thought may go on, because the spirit leaves the body and goes elsewhere. Human life, consciousness, and rational thought are not functions of material substance, but something wholly different, and physical science will never be able to discover and understand their nature.

It is often held, as a part of the substance dualist view, that other animals, unlike human beings, do not have this spiritual nature; other animals cease to exist upon death, but not human beings. This is absurdly *ad hoc*, as many small children naively realize when they ask whether the soul of a deceased pet will go to heaven. More consistent than their elders, such children can see that there is no fundamental biological distinction between human beings and other kinds of animals, and they draw the reasonable conclusion that if the life and consciousness of one sort of animal is due to the presence of a soul, as they have been told, then so must be the life and consciousness of other sorts of animals. They are understandably confused (or outraged, as I remember being) when told that this is not so. As I recall, it was this sort of consideration that first led me to be suspicious of my parents' Christian religion. It cannot be that both the substance dualist view and the scientific view of the nature of persons are true. One view asserts what the other explicitly denies. These two views of the nature of persons are irreconcilably at odds

with each other. I shall now argue that the scientific view is rationally preferable.

When two theories compete for our allegiance, it is good methodology to prefer the theory with greater explanatory power. The scientific view of the nature of persons explains much that the substance dualist view does not.

For example, the scientific view explains why persons with damaged brains cannot think as well as persons with undamaged brains: It is the brain's normal functioning that constitutes thinking, and when the brain can no longer function normally due to structural damage, of course thinking will be substandard. The competing, substance dualist view cannot explain the effects of brain damage upon thinking. If it is the non-physical soul or spirit that thinks, why can't it think just as well in a damaged brain as in an undamaged brain? After all, the soul is supposed to be able to think *without any brain at all*.

The scientific view also explains why mental functioning develops ontogenetically right along with the physical development of the brain and nervous system. Fetuses, babies, and small children possess characteristic levels of mental functioning, lower than the levels of mental functioning possessed by adults, and these levels coincide with the degree of development of the brain. Again, the substance dualist view cannot explain this; the soul is supposed to inhabit the body at some point, at which point the body should presumably possess full mental functioning. There are degrees of mental development, and they appear to depend upon degrees of physical development. For the substance dualist view, this must remain a mystery.

The scientific view, similarly, can explain why mental capacities apparently developed phylogenetically in tandem with brain development. If mental functions are just brain functions, then it makes perfect sense that early hominids with less sophisticated brains were not so bright as more evolutionarily advanced hominids with more sophisticated brains. How is the substance dualist view going to explain this? Did early hominids just happen to have unsophisticated souls, this fact having no relation at all to their degree of brain development? The substance dualist view cannot even explain why humans and dogs have more powerful minds than grasshoppers and lizards. After all, it is supposed to be the non-physical soul that has the thinking power. Why should it be the case that the best-thinking souls always inhabit the bodies with the most highly evolved brains?

Not only does materialism regarding minds have great explanatory power that spiritualism lacks, the assumption that having a mind is just having a functioning brain has brought about much successful research and useful results. Certain forms of mental illness, such as depression, have proven to be treatable by drugs that affect brain chemistry. The drug Prozac, for example, successfully alleviates depression in many individuals by inhibiting the

brain's reuptake of the neurotransmitter serotonin. Surely, to think that such effects are just coincidence stretches credibility to the limit.

Some people suggest, methodological considerations such as the above aside, that there is empirical evidence of the existence of non-physical souls or spirits. For example, it is commonly asserted (by beginning philosophy students, among others) that so-called 'out of body experiences,' including near-death experiences, constitute such evidence. Let us evaluate this suggestion.

Let us assume for the sake of argument that it is empirically well established that 'out of body experiences' do occur *as subjective phenomena*. Suppose that people of many different cultures, ages, and backgrounds, when exposed to certain types of physical trauma, report remarkably similar subjective sensations of 'floating' over their bodies, moving disembodied through space, and so on. The question is, Does the existence of such subjective phenomena lend any logical support to the claim that minds are non-physical spirits?

Not much. Because people can have hallucinatory subjective experiences, the mere report of a subjective experience does not by any means establish that the experience portrays the reality of what is happening. Compare: Suppose it is established that cocaine addicts of all ages and cultures report remarkably similar subjective experiences of bugs crawling all over their bodies. Does it follow from this that cocaine addicts really do have bugs crawling all over their bodies? Of course not. All that follows from the phenomenon of 'cocaine bugs' is that the physical trauma of cocaine addiction sometimes has a certain effect that manifests itself psychologically as the illusion that bugs are crawling on the body. Likewise, all that follows from the phenomenon of 'out of body experiences' is that certain physical traumas (perhaps heart stoppage, oxygen deprivation, the ingestion of certain psychoactive drugs, etc.) sometimes have effects that manifest themselves psychologically as the illusion that one's consciousness is floating disembodied.

What *would* qualify as serious empirical evidence for mind-body dualism? This is an interesting question, because some dualists assert that the mind is a *non-physical substance* that has no weight or mass and takes up no space. Such a substance could not possibly register on any instrument or be empirically detectable in any way.

Compare the situation with the cocaine bugs. What would constitute serious empirical evidence of the actual existence of bugs crawling on the skin of cocaine addicts? If we could capture such bugs and observe them, weigh them and measure them, record their attributes, and so on, that would count. Of course we cannot do that; cocaine addicts experiencing 'cocaine bugs' have no unusual observable or capturable creatures crawling on their skin, even if we look with our best microscopes. But suppose the advocate of the actual existence of cocaine bugs asserts, "Cocaine bugs are very special

bugs. They are non-physical. They take up no space; they have no weight and no mass. They are detectable only from the subjective point of view. Nevertheless, they have real and objective existence.”

If cocaine bugs are presumed to be invisible to objective observers and not detectable by physical instruments, then no possible empirical evidence could qualify as evidence of cocaine bugs’ existence. This is why we don’t believe in the actual existence of cocaine bugs and consider the bugs to be a subjective phenomenon only: There is no actual or possible physical evidence of the existence of the bugs.

Many people reject the hypothesis of non-physical minds, souls, or spirits for similar reasons; there is no physical evidence of the existence of such minds. There are no observations that we need the hypothesis of non-physical minds to explain. All of our observations can seemingly be explained more simply and more coherently with the hypothesis that the mind is just the functioning brain. The plea of those who persist in believing in non-physical minds, souls, or spirits is no better than the plea of our fictional eccentric who persists in believing in cocaine bugs: “Minds are very special things. They are non-physical. ...” Why should we believe in these ‘very special’ entities? Their existence appears to be an unnecessary hypothesis.

The substance dualist, however, may argue that he has an ace up his sleeve. He may argue that there are convincing *a priori* reasons to believe in the existence of non-physical souls or spirits, whereas there are no convincing *a priori* reasons to believe in the existence of cocaine bugs.

It is necessary at this point to digress briefly and explain the philosophical distinction between *a priori* reasons and *a posteriori* reasons. Both sorts of reason are rational considerations (premises) in support of some conclusion. *A posteriori* reasons are evidential in character, drawing upon experiment and observation. *A priori* reasons are conceptual in character, drawing upon what one can know without making observations about the external world.

As an example of an *a posteriori* argument, consider the following. Faraday observed that whenever a magnetic field changes in the presence of a conductor, an electric current is generated in the conductor. Faraday drew the conclusion that this must be a law of nature: Whenever there is a changing magnetic field in the presence of a conductor, an electric current is generated in the conductor. Notice that Faraday’s argument depends on his observations of the behavior of magnetic fields, not on any ‘armchair’ analysis of the concept of a magnetic field.

By contrast, consider the case of Saint Anselm’s *a priori* argument for the existence of God. Anselm argued as follows: It is part of the very concept of God that God is the greatest being that can be imagined. A thing is greater if it exists in reality than if it merely exists as an idea in the mind; this follows from the concept of greatness. Therefore, God must exist in reality. Notice that Anselm does not predicate his argument on any observed evidence at all;

he proceeds by analyzing the concepts of God and greatness, by appealing to what everybody can be expected to know who has mastered these concepts. (One must not conclude that all *a priori* arguments are fallacious on the basis of Anselm's example.)

What would constitute an *a priori* reason to believe in the existence of non-physical minds, souls, or spirits? René Descartes thought he had such reasons. In his *Meditations on First Philosophy*, Descartes argues as follows:

... because I know that all the things that I clearly and distinctly understand can be made by God exactly as I understand them, it is enough that I can clearly and distinctly understand one thing without the other in order for me to be certain that the one thing is different from the other, because at least God can establish them separately. ... For this reason, from the fact that I know that I exist, and that meanwhile I judge that nothing else clearly belongs to my nature or essence except that I am a thing that thinks, I rightly conclude that my essence consists in this alone: that I am only a thing that thinks. Although perhaps (or rather, as I shall soon say, to be sure) I have a body that is very closely joined to me, nevertheless, because on the one hand I have a clear and distinct idea of myself—insofar as I am a thing that thinks and not an extended thing—and because on the other hand I have a distinct idea of a body—insofar as it is merely an extended thing, and not a thing that thinks—it is therefore certain that I am truly distinct from my body, and that I can exist without it.<sup>1</sup>

Descartes offers an additional argument for substance dualism:

... there is a great difference between a mind and a body, because the body, by its very nature, is something divisible, whereas the mind is plainly indivisible. Obviously, when I consider the mind, that is, myself insofar as I am only a thing that thinks, I cannot distinguish any parts in me; rather, I take myself to be one complete thing. Although the whole mind seems to be united to the whole body, nevertheless, were a foot or an arm or any other bodily part amputated, I know that nothing would be taken away from the mind; nor can the faculties of willing, sensing, understanding, and so on be called its 'parts,' because it is one and the same mind that wills, senses, and understands. On the other hand, no corporeal or extended thing can be thought by me that I did not easily in thought divide into parts; in this way I know that it is divisible. If I did not yet know it from any other source, this consideration alone would suffice to teach me that the mind is wholly different from the body.

Call these two arguments, respectively, Descartes's first and second arguments for substance dualism. Do these arguments have any force? Let us examine them one at a time.

Descartes's first argument for substance dualism is somewhat difficult to understand without some familiarity with the *Meditations* as an entire work. Descartes argues in the earlier sections of the *Meditations* that God exists and is not a deceiver.<sup>2</sup> Such a non-deceptive God, according to Descartes, would not allow his creatures to be led into error by careful use of their most

‘clear and distinct’ modes of reasoning, such as mathematical reasoning and deductive logical reasoning.<sup>3</sup> Following up on these ideas, Descartes argues for substance dualism roughly as follows: Mind and body clearly have different conceptual essences; the essence of mind is to think, the essence of body is to be extended. Since mind and body have this ‘clear and distinct’ logical difference, and God would not allow us to be deceived with regard to what we so ‘clearly and distinctly’ conceive, mind and body must really be distinct substances.

Descartes’s first argument for substance dualism is not very convincing. From the fact that mind and body have different conceptual essences, it may follow that mind and body are not *necessarily* the same substance, but it does not follow that mind and body are not in fact the same substance. Consider an analogy. Barbara Hannan is not necessarily the same person as the author of *Subjectivity and Reduction*. Being Barbara Hannan is conceptually or essentially distinct from being the author of *Subjectivity and Reduction*. We can clearly conceive of (imagine) a situation in which Barbara Hannan is not the author of *Subjectivity and Reduction*. Nevertheless, as a matter of contingent fact, Barbara Hannan is the author of *Subjectivity and Reduction*.

Descartes’s first argument for substance dualism fails because he attempts to draw a factual conclusion (mind and body really are distinct substances) from a modal premise (mind and body are possibly or conceivably distinct substances). Even if God exists, it is apparent that he allows us to imagine or conceive many possible scenarios that do not reflect the facts. Descartes’s conception of his mind existing apart from his body could be one of those vivid but false imaginings.

Descartes’s second argument for substance dualism is perhaps more interesting. He argues that bodies are divisible and minds are not divisible; therefore, bodies and minds cannot be the same substance. This argument, unlike Descartes’s first argument for substance dualism, at least appears on the surface to be valid (if the premise were true, it looks as if the conclusion would follow logically). And, at least on one reading of the premise, the premise is true: It does seem that there is something conceptually incorrect in speaking of minds being divisible into parts in the same way that bodies are divisible into parts.

The argument’s superficial appearance of validity, however, is deceptive. Suppose we give Descartes’s premise the (plausible) reading just suggested: There is something conceptually odd about speaking of minds being divisible into parts in the same way that bodies are divisible into parts. Does it follow that mind and body must be two distinct *substances*? No; all that follows is that the concept of mind is not logically analogous to the concept of body. The concept of a mind is the concept of a set of capacities for intelligent behavior. Sets of capacities may be divisible in a certain sense (it is possible to



possess some but not all of the set), but a set of capacities cannot be cut up with a knife, as a physical structure can. This logical difference between the concept of mind and the concept of body does not, however, mean that the two concepts refer to separate substances. Brains, or whole living persons, could be purely physical structures possessing the mental capacities at issue. If this were the case (and I believe it is the case), then we would have two conceptual schemes with two separate logics, but both conceptual schemes would refer to one and the same physical substance.

Descartes's second argument for substance dualism, then, is as doubtful as Descartes's first argument for substance dualism.

Descartes is not the only famous philosopher who has argued for substance dualism. Plato, in his dialogues, puts various arguments for substance dualism in the mouth of Socrates. One of these Socratic arguments for substance dualism, occurring in the *Meno* dialogue,<sup>4</sup> is interesting enough to be worthy of our attention.

In the *Meno*, Socrates demonstrates that a slave boy who has never been taught mathematics possesses enough native mathematical intuition to answer correctly a lot of questions about a geometry problem. Socrates' diagnosis of the situation is that the slave boy somehow knows a lot about mathematics without being taught; questioning serves to bring out knowledge that is already in the boy's mind. When we come to possess knowledge in this life, according to Socrates, we are merely recollecting what we already knew. Since knowledge is not originally acquired in this life, Socrates reasons, it must be acquired in a former existence, either in some other incarnation or when the soul is disembodied.

In effect, Plato's Socrates uses the doctrine of knowledge as recollection to argue for mind-body dualism. We need not accept that the soul is a separate entity from the body unless we accept the premise that there is no true learning in this life but only recollection of knowledge absorbed in past lives. It is hard to see why one would feel compelled to accept such an odd premise. It remains an open possibility that genuine learning does occur in our lives and that such native capacities as mathematical intuition can be explained in biological terms rather than in mystical terms. If non-mystical explanations can be given of the acquisition of human knowledge, then the Platonic motivation to be a substance dualist vanishes.

There remains one other popular argument for mind-body dualism, which might be called the argument from free will.

The proponent of the argument from free will is apt to say something along the following lines: "The hypothesis that the mind is just the brain has unacceptable consequences. Suppose that the mind is just the brain. Then, all mental states are physical states of brains, including the mental states that cause the sort of voluntary behavior we call free action. Whether a particular physical state of the brain will come about is due to a long series of physical

causes, a series extending to environmental events outside the control of the agent. Accordingly, whether a particular bit of so-called voluntary behavior will occur is also due to a long series of physical causes, a series extending to biological and environmental causes outside the control of the agent. If this is the case, then all of our behavior is causally determined by factors beyond our control; so-called voluntary behavior is not really voluntary, people do not really perform free actions, and no one is responsible for anything he or she does. This is unacceptable; we do perform free actions, and we are sometimes responsible for what we do. Therefore, the mind must be something besides the brain; the mind must be a non-physical substance, free of the physical causal nexus, that makes undetermined decisions to perform voluntary acts and is wholly responsible for the resultant acts." One short answer to the argument from free will is simply to deny that we have free will; the dualist is not entitled to assume that we do. Even if it is granted that humans have 'free will' in some sense of that term, the argument from free will still fails. 'Free will' can be understood to mean something compatible with the physical causation of human action.

From the premises that minds are brains and mental states are brain states, it does not follow that people don't perform free, voluntary actions and that people are not responsible for their actions. Sorting out this particular variety of confusion, and explaining why it is wrongheaded, has been the project of theorists called compatibilists or soft determinists who write about the philosophical problem known as the problem of free will and determinism.<sup>5</sup> My primary concern in this book is the mind-body problem, not the problem of free will and determinism, but in order to defeat the argument from free will for mind-body dualism I must conduct a brief foray into the free will and determinism problem. I shall briefly explain compatibilism and why I take it to be the correct position.

According to the compatibilist, the existence of free action and the correct ascription of moral responsibility for action are compatible with its being the case that humans are wholly physical organisms whose behavior is subject to exhaustive causal explanation in terms of physical states. When we say that a given action was freely done, we do not mean that the action had no physical causal chain leading up to it. Rather, we mean that the action was not the result of force, constraint, pathology, or relevant mistake of fact. We mean that the chain of physical events leading up to the act had certain features and lacked certain other features, not that the physical causal chain was gappy or wasn't there.

The compatibilist holds that decisions regarding which actions are free and which are unfree, and decisions regarding who is and is not responsible for actions, are made quite without regard to the question of whether action is causally determined. Such decisions are made on the basis of the answers to questions, like: Did the agent have the normal capacities to understand

the nature of his behavior and to conform his behavior to his intentions or was he suffering from some disease or other physical condition that interfered with these capacities? Was the agent under the influence of any psycho-active substance, and if so, was the ingestion of that substance voluntary or involuntary? Was the agent acting under some relevant mistake of fact, and if so, was his mistake reasonable? Was the agent's action the result of his own desires and intentions, or was the agent being forced by someone else to behave contrary to his own desires and intentions? And so on.

Notice that the question is never, Was the agent's behavior caused by some chain of physical events? but rather, *What* chain of physical events caused the agent's behavior in this case, and were any of these physical causes relevantly unusual? Notice that this is the way responsibility is regarded in criminal law and tort law. The compatibilist suggests that holding one another responsible for certain types of normally produced behavior is a socially useful practice. Since normal individuals have the capacity to foresee that they will be held responsible, morally and legally, for certain sorts of conduct, the existence of moral and legal sanctions serves as a causal factor that influences behavior, in general, for the good of society. We decline to hold persons responsible where, for one reason or another, there would be no social usefulness in holding them responsible (as, for example, in the case of insane and retarded persons who lack the capacity to be deterred from conduct by the prospect of sanctions). These social practices having to do with action and responsibility may plausibly be taken to presuppose that actions result from chains of physical causes. At the very least, these practices do *not* presuppose that action is *not* the result of such physical causal chains.<sup>6</sup>

There will be individuals who will maintain, at this point in the discussion, that the compatibilist view of freedom and responsibility is counter-intuitive. I can only reply that I do not find it so. I find it vastly more intuitive than its competitors, one of which is the (wild, I think) proposal that people never perform free actions and are never responsible for what they do, and the other of which is the mysterious idea that agents are non-physical, spiritual things that somehow cause or causally influence particular physical events. One reason that the latter idea strikes me as so counterintuitive is the so-called interaction problem: If the mind really is a non-physical thing, how does it manage to cause physical events in the brain and body? How do two such different substances interact?

My experience is that the substance dualist, faced with the interaction problem, usually offers the following counterargument: Causal interaction between physical things is just as mysterious as causal interaction between physical things and non-physical things. We do not understand any kind of causal interaction, so mind-body causal interaction presents no *special* problem.

This point has some force; causal interaction of any kind is mysterious. But it does seem methodologically troublesome to take one mystery and add another to it. Isn't one sort of mysterious causation, physical-physical causation, enough, without positing another sort of mysterious causation, mental-physical causation? It would seem preferable to eschew a proliferation of mysteries unless we really need an additional mystery to account for something important. Since there exists an account of free action and responsibility compatible with it being the case that there is only one sort of causation, physical-physical causation, I submit that there is no reason to admit a mysterious new variety of causation into the picture. The conclusion appears inescapable: The rational course is to abandon the substance dualist view of the nature of persons and embrace the scientific view of the nature of persons, with its ontological materialism. We cannot have it both ways, and there are overwhelming evidential and methodological considerations weighing on the side of science and materialism. It is only when the specter of substance dualism has been exorcised that serious work on the mind-body problem can begin.

Let the reader be assured, I am not advocating a crude scientism, according to which we must turn to science to answer all our questions. Philosophy has its place. Conceptual and metaphysical questions present themselves to the human mind as worthy of answers, yet these are not scientific questions, as they cannot be answered by appeal to observation and experiment. (Actually, even scientific questions properly so called cannot be answered purely by appeal to observation and experiment, but I will put that point aside for our purposes.)

We would not turn to science to answer a normative question, such as 'What principles would govern a just society?' Such questions are properly addressed by philosophical ethics, which takes a rigorous, analytic approach to the analysis of concepts such as justice and right action.

There are other conceptual questions besides normative questions, and other branches of philosophy besides ethics. Science itself depends on such notions as that of justified belief, well-confirmed theory, truth, rationality. Epistemology, logic, and philosophy of science investigate such concepts, seeking a deeper understanding than is sought by scientists, who presuppose these notions without analysis.

Nor can science answer the metaphysical questions that arise in the periphery of even the most successful empirical theories. Quantum mechanics, for example, makes strikingly successful probabilistic predictions regarding the measured behavior of subatomic particles, but quantum mechanics cannot tell us what is really happening in the subatomic world between measurements; the latter is a metaphysical question to which the mind of a curious scientist irresistibly turns, even if the scientist is nominally of the

positivist bent that officially eschews speculation into matters beyond what is directly observable and measurable.

Philosophy begins where science ends, and science surely ends before all interesting questions are answered. The question of whether there exists a special mental substance, however, has been satisfactorily answered by science, or so I have argued. Having an appropriately functioning brain is sufficient to have a mind; no substance but physical substance is necessary. Materialism has won the day, and remaining philosophical problems concerning the mind arise within a materialist framework.